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# Can we trust corporates GHG inventories? An investigation among Canada's large final emitters



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## HIGHLIGHTS

- The complexity of GHG emission measurement is underestimated in the public sphere.
- The data disclosed by companies to the different stakeholders lack transparency.
- The auditors' lack of competence and independence undermine the credibility of audit reports.

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## ABSTRACT

In the public sphere and the literature on climate strategies, the measurability of corporate GHG emissions tends to be taken for granted, and few empirical studies have examined the reliability of such data. The present case study, which was conducted among 10 Canadian companies considered as large final emitters and three auditing firms, focuses on the factors which could affect the perceived credibility of GHG inventories and the strategic implications of these. The qualitative, inductive study allows identifying three main factors which affect trust in business inventories: technical issues and complexity of GHG measurements, lack of transparency on the part of the companies and unreliability of verification mechanisms. The study also makes it possible to evaluate the implications of uncertainties concerning GHG inventories which are of strategic importance for companies and policy makers. While the reliability of GHG measurement is taken for granted at the political level, uncertainties in this area can in fact have a huge impact on the establishment of the cap and trade system. The study also contributes to the literature on carbon accounting by shedding light on underexplored ethical issues, including the lack of independence of auditors and its implications.

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## 1. Introduction

Ever more numerous managers face the challenge of taking into consideration the problem of climate change in their business strategies. In a study by McKinsey (2008), 60% of the 2192 managers interviewed stated that climate change constitutes an important dimension which should be included into the overall strategy of the company. Accounting of corporate GHG emissions constitutes a crucial preliminary step in meeting this new challenge (Hoffman, 2006; Schultz and Williamson, 2005). However, in the literature on climate strategies, the reliability of information on GHG emissions tends to be taken for granted. In fact, most empirical studies on companies' actions aimed at reducing GHG assume that performance in this area can be measured in a relatively accurate manner (e.g. Boiral et al., 2012; Cowan and

Deegan, 2011; Prado-Lorenzo and Garcia-Sanchez, 2010; Prado-Lorenzo et al., 2009). Indeed, the validity of this assumption has not hitherto been questioned.

The present article aims to analyze the manner in which uncertainties in the measurement and verification of GHG emissions are interpreted in Canadian industrial companies and the implications that these uncertainties have for climate strategies. The results of the analysis may have major managerial, institutional and political implications.

Firstly, the inventory data allow to establish the main emission sources and to identify initiatives to prioritize. The development of climate change performance indicators allows a company to evaluate the effectiveness of the mitigating measures and to compare its own performance with that of companies operating in different sectors. The indicators also play an important role in assessing the feasibility of projects, internalizing the potential carbon costs and allocating internal resources (Burritt et al., 2011; Matthews et al., 2008; Sullivan and Gouldson, 2012). In this light, the reliability of the data contained in the inventory is essential to

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ensure an adequate assessment of risks and opportunities by companies.

Secondly, carbon accounting allows to respond to the increasing pressure by investors, politicians and consumers in the area of climate-change related issues (Stechemesser and Guenther, 2012). The pressure has led in particular to companies being strongly encouraged to disclose their GHG performance to legitimize their industrial activities (Prado-Lorenzo and Garcia-Sanchez, 2010; Cowan and Deegan, 2011; Hraskey, 2012). This practice has become increasingly popular during the last decade. For example, the participation rate of FT500 companies in the Carbon Disclosure Project (CDP), an initiative of voluntary disclosure of environmental information, increased from 46% in 2003 to 77% in 2007 (Pinkse and Kolk, 2009). Information disclosed by companies can influence investment decisions, and the manner in which companies respond to climate risks can have serious financial consequences, and potentially affect the performance of the investment portfolio (Bowen and Wittneben, 2011; Sullivan and Gouldson, 2012).

Thirdly, GHG accounting has a considerable political dimension, as companies' data is essential for the development and evaluation of regulations and international climate agreements (Hoffmann and Busch, 2008; Schaltegger and Csutora, 2012). For example, in Canada in 2010, 38% of total GHG emissions were generated by 537 industrial facilities considered as large final emitters – emissions of more than 50,000 tones of CO<sub>2</sub> equivalent per year (Environment Canada, 2012a). It is therefore impossible for the policy and decision makers to develop and adopt new climate policies without taking into consideration the business inventories, particularly those of companies with high energy consumption. The carbon performance indicators of companies are also a key source of information for assessing the efficiency and feasibility of climate policy (Hoffmann and Busch, 2008). A political decision like that of creating a cap and trade system of emission allowances has serious consequences for some companies, as it generates economic cost for activities which were traditionally free of charge (Bebbington and Larrinaga-González, 2008; MacKenzie, 2009). According to the World Bank data, USD 142 billion were traded on carbon markets in 2010, which represents a significant increase in comparison with USD 32 billion in 2006 (Carbon Finance, 2011). This tendency is likely to continue, with new emissions trading markets emerging, such as the “Western Climate Initiative” which has come into effect in 2013 in California and Quebec. Implementing trading mechanisms requires adopting strong procedures and requirements for the accounting and verification of carbon emissions to ensure the validity of corporate GHG inventories (Rypdal and Winiwarer, 2001).

Despite the managerial, institutional and political significance of the reliability of corporate GHG inventories, little research has been conducted on the process of data collecting, reporting and verification (Hopwood, 2009; Kolk et al., 2008; Milne and Grubnic, 2011; Schaltegger and Csutora, 2012). The credibility and reliability of the data is difficult to assess due to the lack of information on corporate practices. The majority of studies which address the uncertainties in accounting GHG emissions were carried out at the level of national inventories and their estimates vary considerably (e.g. Rypdal and Winiwarer, 2001; Gupta et al., 2003; Monni et al., 2004). This is a cause for concern given the potential financial and political consequences of errors in the measurement.

The present study focuses on the authority of numbers, i. e. the credibility which the measurement system inspires as a knowledge and communication tool (Espeland and Stevens, 2008). To be credible, the data must be valid and representative of the phenomenon under investigation (Desrosières, 1998, 2001) and allow to solve problems (Porter, 1995). In the specific case of GHG inventories, the representativeness of inventories is often assumed to be self-evident. The present study questions this assumption

and analyzes the manner in which uncertainties in the measurement and verification of GHG emissions are interpreted in industrial companies and the implications that those have for climate strategies. Its contribution to the literature on carbon accounting consists in identifying factors which may affect the credibility of business inventories. No in-depth, specific studies have so far been conducted on the subject of confidence in inventories. The present paper highlights in particular the lack of companies' transparency and the shortcomings of skills and impartiality among GHG inventories auditors. These emergent aspects have important implications for the development of climate strategies for business managers and policy makers.

The rest of the paper is organized as follows: In the first part, the literature review is presented. The following section describes the methodological aspects and the main results of the study. The final part is devoted to the discussion of the results, their implications and avenues for future research.

## 2. The reliability of companies' GHG inventories

The emergence of climate change issues in the public sphere gave an impulse for the development of a measurement system to evaluate the potential impact of different industrial activities. This process of GHG quantification was made possible thanks to the negotiations which led to the adoption of a series of “conventions of equivalence” (Desrosières, 1998), which include, among others, codified and standardized procedures leading to the estimation of emissions. These efforts to make the different gas emissions commensurable were necessary to meet the new requirements of carbon markets (MacKenzie, 2009). A number of protocols were developed to regulate company emissions accounting, the most recognized and most widely used initiative in this area being the “GHG Protocol”. The methodology, launched in 2001, was developed in partnership between the “World Resources Institute” (WRI) and “World Business Council for Sustainable Development” (WBCSD). It includes in particular the steps necessary for the accounting and disclosure of GHG performance (WBCSD and WRI, 2004). The protocol provided the foundations for the ISO 14064 standardization procedures. The adoption of these standards and procedures by the companies allowed to enhance the credibility and validity of inventories.

These elements are crucial for companies which wish to participate in the carbon market or to demonstrate their compliance with government regulations. The adoption of standardized rules allows to limit the individual subjectivity. Porter (1995) describes the phenomenon as the “mechanical objectivity”, to which trust in numbers, based on and compliance with the standardized rules, is central: “The mechanical objectivity is grounded in quantification that conforms to standardized rules about how to derive, manipulate and use numbers.” (Espeland and Stevens, 2008, p. 420). In this manner, the validity and legitimacy of data often come to depend more on administrative processes than on the reality of the measured object. One consequence of this standardization is that the measure is often taken for granted (Power, 2004).

In the specific case of the quantification of GHG emissions, additional research must be conducted to better understand the measurement reliability and the process of accounting (Burritt et al., 2011; Milne and Grubnic, 2011). Even though this accounting process is increasingly based on homogenous, internationally-recognized standards and audit mechanisms, few studies have been devoted to its reliability. However, the question arises whether one can trust these measurement systems, which were created to ensure rigorous monitoring of GHG emissions in companies and other entities. This measurement issue remains underexplored; however, it has been indirectly addressed in the

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